UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,894	08/10/2001	Douglas E. Jewett	3WARE.011A	4791

20995 7590 03/09/2006

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
NANO, SARGON N	
ART UNIT	**PAPER NUMBER**
2157	

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/927,894	JEWETT ET AL.	
	Examiner	Art Unit	
	Sargon N. Nano	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/14/06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 59* is/are pending in the application.

4a) Of the above claim(s) *38 - 53* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 37, 54 - 59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

1. This office action is responsive to communication received on Feb. 13, 2006. Applicant's arguments have been fully considered and are persuasive. The finality of the office action has been withdrawn. Claims 1 – 37 and 54 – 59 are pending examination

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 – 37 and 54 – 59 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. U.S. Patent No. 6,834,326. Wang teaches transparent access to a redundant array of devices, provides method and device for connecting redundant disk devices to a controller. (see abstract).

As to claim 1, Wang teaches a block-level shared network storage system, comprising:

a storage server comprising an array of disk drives, and comprising a processor that runs a device driver to provide block-level access to data stored on the array of disk

drives (see col.5 line 64 – col. 6 line 10 and fig. 4. Wang discloses an array of shared disks for data storing); and

a host computer coupled to the storage server by at least one computer network (see col.8 line 42 – 54 Wang discloses a controller or a host which is connected to multiple disks or storage devices); wherein the host computer and the storage server perform input/output (I/O) operations over the at least one network using multiple, concurrent logical connections, each logical connection being between the host computer and the storage server over the at least once computer network such that a first I/O operation is executed over a first logical connection while a second I/O operation is executed over a second logical connection (see col. 8 lines 42 – 54 and fig. 6 , Wang discloses multiple block of read/write operation to occur over multiple connection).

As to claim 2, Wang teaches the network storage system as in Claim 1, wherein each logical connection is a socket connection (see col. 22 line 31 – 38 and fig.11).

As to claim 3, Wang teaches the network storage system as in Claim 2, wherein each socket connection is a TCP/IP socket connection (see fig. 7).

As to claim 4, Wang teaches the network storage system as in Claim 1, wherein each logical connection remains persistent over multiple I/O operations performed over that logical connection (see col.8 lines 42 – 54.).

As to claim 5, Wang teaches the network storage system as in Claim 1, wherein the host computer is programmed to divide an I/O operation into multiple constituent operations, and to perform the multiple constituent I/O operations in parallel over

respective logical connections of said multiple, concurrent logical connections (see col.8 lines 42 – 54).

As to claim 6, Wang teaches the network storage system as in Claim 1, wherein the storage server provides virtualized block-level storage access to the host computer such that the storage server is treated as local disk drive storage by user-level processes running on the host computer (see col. 5 lines 5 – 24).

As to claim 7, Wang teaches the network storage system as in Claim 1, wherein the storage server is configurable to provide multiple storage partitions, each of which may be allocated to a different host computer (see col. 5 lines 5 – 24).

As to claim 8, Wang teaches the network storage system as in Claim 1, wherein the storage server has a first storage partition which is uniquely assigned to the host computer such that the first storage partition appears to user-level processes running on the host computer as a private, local disk drive (see col. 15 lines 49 – 67).

As to claim 9, Wang teaches the network storage system as in Claim 8, wherein the storage server further has a second storage partition which is uniquely assigned to a second host computer (see col. 15 lines 49 – 67).

As to claim 10, Wang teaches the network storage system as in Claim 8, wherein the storage server further has a second storage partition which is shared by multiple host computers (see fig. 6).

As to claim 11, Wang teaches the network storage system as in Claim 1, wherein the host computer and the storage server implement an authentication protocol in which

the storage server authenticates the host computer before allowing the host computer to perform input/output operations (see col. 10 lines 38 – 47).

As to claim 12, Wang teaches the network storage system as in Claim 1, wherein the host computer and the storage server implement a discovery protocol in which the storage server notifies the host computer of partitions assigned to the host computer (see col. 8 lines 65 – col. 9 line12).

As to claim 13, Wang teaches the network storage system as in Claim 1, wherein at least one of the logical connections is over a general-purpose computer network (see fig. 10).

As to claim 14, Wang teaches the network storage system as in Claim 1, wherein at least one of the logical connections is over an Ethernet network (see fig.12 item # 1210).

As to claim 15, Wang teaches the network storage system as in Claim 1, wherein the first and second logical connections exist over separate computer networks (see fig. 6).

As to claim 16, Wang teaches the network storage system as in Claim 1, wherein each logical connection exists between a respective reader/writer pair (see col. 9 lines 46 – 53).

As to claim 17, Wang teaches the network storage system as in Claim 1, wherein the host computer and the storage server are interconnected by at least one switch (see fig. 5).

As to claim 18, Wang teaches the network storage system as in Claim 1, wherein the host computer and the storage server each include two network interfaces that provide redundant network connections between the host computer and the storage server (see col. 10 line 66- col. 11 line10).

As to claim 19, Wang teaches a system for storing data for host computers, comprising:

a plurality of storage servers connected to a network, each storage server comprising an array of disk drives, an array controller, and a processor (see col.5 line 64 – col. 6 line 10 and fig. 4);

a plurality of host computers connected to the network and programmed to store data on the storage servers and at least one switch which interconnects the plurality of storage servers with the plurality of host computers wherein each host computer is programmed to open multiple concurrent sees socket connections over the network to the storage servers for performing concurrent input/output operations (see col. 8 lines 42 – 54 and fig. 6).

As to claim 20, Wang teaches the system of Claim 19, wherein the sockets socket connections are TCP/IP sockets connections (see fig. 7 Wang discloses network protocol includes transporting the IP packet using TCP).

As to claim 21, Wang teaches the system of Claim 19, wherein each storage server of the plurality of storage; servers provides virtualized block-level storage access to the host computers such that the Week storage servers appear are treated as local

disk drive storage to by user-level processes running on the host computers (see claim 55).

As to claim 22, Wang teaches the system of Claim 19, wherein at least a first host computer of the plurality of host computers is programmed to divide an 1/O operation into multiple constituent 1/O operations, and to perform the multiple constituent 1/0 operations in parallel over respective logical socket connections between the first host computer and a target storage server (see col. 8 lines 42 – 54 and fig. 6).

As to claim 23, Wang teaches the system of Claim 19, wherein a first storage server of the plurality of storage servers is configurable to provide multiple, variable-size partitions, each of which may be allocated to a different host computer of the plurality of host computers (see col. 8 lines 56 – 63 and fig. 6).

As to claim 24, Wang teaches the system of Claim 19, wherein a first storage server of the plurality of storage servers has a first partition which is uniquely assigned to a first host computer of the plurality of host computers such that the first partition appears as a local disk drive to the first host computer (see col. 8 lines 56 – 63 and fig. 6).

As to claim 25, Wang teaches the system of Claim 24, wherein the first storage server further has a second partition which is uniquely assigned to a second host computer of the plurality of host computers (see col. 8 lines 56 – 63 and fig. 6).

As to claim 26, Wang teaches the system of Claim 19, wherein the host computers and the storage servers implement: an authentication protocol in which a

storage server authenticates a host computer before allowing the host computer to perform input/output operations (see col. 10 lines 32 – 47).

As to claim 27, Wang teaches the system of Claim 19, wherein the host computers and the storage servers implement a discovery protocol in which a storage server notifies a host computer of partitions assigned to the host computer (see col. 8 lines 65 – col. 9 line12).

As to claim 28, Wang teaches a method of performing input/output operations, comprising: establishing first and second TCP/IP connections between a host computer and a block-level storage server over one or more computer networks (see claim 8 and fig. 7);

performing a first input/output operation over the first TCP/IP connection while concurrently with performing a second input/output operation over the second TCP/IP connection, each of said input/output operations comprising a transfer of input/output data between the host computer and the storage server; and maintaining the first and second TCP/IP connections is a persistent state such that each TCP/IP connection may be used to perform additional input/output operations (see col.8 lines 42 – 54).

As to claim 29, Wang teaches the method as in Claim 28, wherein the first and second TCP/IP connections are established over separate computer networks (see col.8 lines 42 – 54).

As to claim 30, Wang teaches the method as in Claim 28, wherein the first input/output operation is a first 1/O request issued from a first application running on the

host computer, and the second input/output operation is a second 1/O request issued from a second application running on the host computer (see col. 9 lines 13 - 43).

As to claim 31, Wang teaches the method as in Claim 28, wherein the first and second input/output operations are constituent operations of an I/O request issued by a process running on the host computer, whereby the 1/O request is executed in parallel over multiple TCP/IP connections (see col. 8 lines 42 – 54 and fig. 6).

As to claim 32, Wang teaches the method as in Claim 28, further comprising establishing a third TCP/IP connection between the host computer and the storage server, and using the third TCP/IP connection to perform an authentication sequence in which the storage server authenticates the host computer (see col. 10 lines 33 – 47).

As to claim 33, Wang teaches the method as in Claim 32, further comprising conveying access information over the third TCP/IP connection from the storage server to the host computer, said access information specifying access rights uniquely assigned to the host computer (see col. 10 lines 33 – 47).

As to claim 34, Wang teaches a method of executing an input/output (1/O) request received from a user-level process running on a host computer, comprising:
on the host computer, dividing the 1/O request into multiple constituent I/O operations (see col.8 lines 42 – 54); and

performing the multiple constituent T/O operations in parallel over multiple, respective logical network connections between the host computer and a target storage

server such that I/O data is transferred between the host computer and the storage server over each of the logical network connections (see col. lines 42 – 54).

As to claim 35, Wang teaches the method of Claim 34, wherein each logical network connection is a socket connection (see col. (see col. 22 line 31 – 38 and fig.11).

As to claim 36, Wang teaches the method of Claim 34, wherein each logical network connection is a TCP/IP socket connection (see fig. 7).

As to claim 37, Wang teaches the method of Claim 34, wherein at least one of the logical network connections is over a general-purpose computer network (see fig. 10).

As to claim 54, Wang teaches the network storage system as in claim 1, wherein the host computer and the storage server communicate with each other over each of the logical connections using a TCP/IP protocol (see col. 8 lines 42 – 54 and fig. 6).
As to claim 55, Wang teaches the system of Claim 19, wherein a first host computer of said plurality of host computers is programmed to open first and second socket connections over the network to a first storage server of said plurality of storage servers, and to perform a first input/output operation over the first socket connection while performing a second input/output operation over the second socket connection (see col. 8 lines 42 – 54 and fig. 6).

As to claim 56, Wang teaches the system of Claim 19, wherein the host computers and storage servers are programmed to perform said input/output operations via TCP/IP communications over said socket connections (see col. 22 line 31 – 38 and fig.11).

As to claim 57, Wang teaches a computer program represented in computer storage, said computer program comprising executable instructions for performing the method of Claim 28 (see claim 8 and fig. 7);

As to claim 58, Wang teaches the method of Claim 34, wherein performing the multiple constituent I/O operations comprises the host computer communicating with the target storage server over the multiple logical network connections using a TCP/IP protocol (see col. 8 lines 42 – 54 and fig. 6).

As to claim 59, Wang teaches a computer program represented in computer storage, said computer program comprising executable instructions for performing the method of Claim 34 (see col.8 lines 42 – 54)

Response to Arguments

3. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Freitas et al. U.S. Patent No.6,003,045. Teaches a method and apparatus for accessing stored files from multiple storage.
- Oliveira et al. U.S.Patent No. 6,983,330. Teaches a method and apparatus for using multiple paths for processing out of bound commands.

- Slaughter et al. U.S. Patent No. 6,970,896. Teaches method and apparatus to discover services and negotiate capabilities.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sargon N. Nano whose telephone number is (571) 272-4007. The examiner can normally be reached on 8 hour.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sargon Nano
March.1, 2006

ARIO ETIENNE